The Excavating Engineer

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Building the Olympic Highway in Washington with a Diesel Shovel

K. L. Goulter & Company is Operating a One-Yard Shovel Equipped with a Full Diesel Engine in Material Approaching Solid Rock in Its Consistency, at a Fuel Consumption of 14 Gallons in 8 Hours at 9c a Gallon

THE Northwest, famous for its scenery, is making the best of its great asset. Every once in so often we hear of the construction of highways that will make accessible to the motoring public some section especially noted for its scenic beauty.

The Olympic Highway is the latest of these, and from what we can gather will bid fair to rank among the most picturesque highways of the Northwest. Its course is from Olympia at the foot of Puget Sound north to the city of Shelton, and along the Hoods Canal to Port Townsend, where Puget Sound enters the Straight of Juan de Fuca. From here it turns west through Port Angeles as far as the ocean, where a magnificent view, at close quarters is obtained of the Olympic Mountains.

Eventually it is expected that it will make a complete circle around the entire Olympic Peninsula, running south down the coast to connect with the Grey's Harbor County Highway.

This article has to do with that portion of this new highway between Port Angeles and Agnew, a

This photograph was taken at a point just across the fill shown in photograph on the opposite page. It shows the Bucyrus 30-B Diesel shovel after it had completed the temporary fill on w ich it crossed the ravine. It is switchbacking up from a point 25 feet below grade, and is now at ab out the grade line of the completed fill.

Views of K. L. Goulter & Company's contract near Port Angeles. The lower view shows the fill illustrated on our previous pages in an earlier stage of its construction. Two men are used around the shovel, an operator, Martin O'Toole, and his helper, Roy Jenkins. The latter does the pit work and miscellaneous other jobs around the machine; when not otherwise engaged he pulls the dump cord. This 30-B Bucyrus Diesel shovel is burning 14 gallons of fuel oil at 9c a gallon delivered, in 8 hours, digging a conglomerated as tough as solid rock.

distance of eight miles, in the northern part of Clallam County.

This work has been awarded to K. L. Goulter & Company of Ilwaco, Washington.

At present there is a road connecting these two points which is narrow, crooked and frequently bridged. The Washington State Highway Commission's plan is to widen, straighten and shorten this route, abandoning the old route.

The contract calls for 287,000 cubic yards of excavation, operations on which is now under way. Our photographs illustrate an early stage of the work, where Mr. Goulter was confronted with the task of building a 20,000-yard fill, across a deep gully.

Work began on that side of the gully nearest the town of Port Angeles, which may just be distinguished in the background of our full-page view. The shovel started working towards the town. The cutting here was not sufficient to complete the fill, consequently it was made just wide enough to permit the shovel to cross and start on the opposite side. It was necessary, after crossing the fill, to dig up on a series of switch-backs from a point 25 feet below grade. This is illustrated in our views.

The material at this point was sand and gravel, with a five-foot layer of very hard cemented gravel.

Diesel Shovel Operation

Mr. Goulter purchased for this work a new Bucyrus 30-B revolving shovel, caterpillar mounted, equipped with a 55 H. P. Diesel engine. On the above-mentioned work, only two White trucks were used, but with these the shovel succeeded in turning out 600 yards in eight hours.

As the work progressed the material encountered got tougher. It consisted of a conglomerate that could hardly be classified as solid rock, but was equally hard to dig, all of it having to be shot.

Two trucks were still in use on a short haul with two small two-ton Mack trucks in reserve.

Fuel Consumption

Even with this heavy digging, the fuel consumption has been remarkable. At the time we go to press the shovel is averaging 14 gallons of fuel oil in eight hours. This oil is what is known as "Diesol," a product of the Union Oil Company, and is delivered at the machine for 9 cents a gallon. This makes a daily fuel cost of $1.26.

The machine is also using five gallons of heavy engine oil and ½ pound of grease and the same amount of gear "dope" in 8 hours.

The crew about the shovel consists of two men, the engineer and a helper who does the pit work. Incidentally, Mr. Goulter's complete force consists of a superintendent, a shovel operator, one helper, two truck drivers and one other man on the dump, a total of six men for a 287,000-yard job!

The work is under the supervision of Leslie Rubican for the State.

New Haven Contractor Builds Road in Record Time

To those of us who are concerned with road grading and paving, the account of a particularly notable piece of work just north of New Haven, on what is known as the Saybrook Road, may be of interest.

C. W. Blakeslee & Sons, well-known contractors of New Haven, Connecticut, may be given the credit of establishing a road-building record in the state of Connecticut, having completed four miles of grading and paving in forty-nine days.

The contract which was awarded by the State Highway Department on April 1, 1923, at a cost of $200,000, extends from the Branford town line to the Village of Guilford, Connecticut, and is a part of Federal Aid Project No. 11.

The grading was done by two ¾-yard shovels, and consisted of 9,000 yards of rock and 8,000 yards of earth. Twenty thousand yards of borrow was required, nine thousand of which was used for an approach to a bridge built over the West River, having a span of 80 feet. The maximum depth of the grading was twenty-two feet. Mack trucks were used to haul the material to the fill.

The width of the concreting is twenty feet with a thickness of 8 inches, one-half section ten feet wide being laid at a time. The average yardage of concreting maintained throughout the work was two hundred yards a day. 102,000 pounds of reinforced steel was used.

C. W. Blakeslee & Sons have had remarkable success with all of the work that they have undertaken. They have recently been awarded another contract on Federal Aid Project No. 11, from Branford to New London, in addition to another from Guilford to Madison.

Mr. D. A. Blakeslee and Mr. Clarence Blakeslee are the partners in the firm, while Mr. R. J. Reigelhuth is general superintendent. Mr. C. C. Robertson was superintendent on the contract described above.

Jim's Remarks

When the report of personal injury sustained by a teamster at the road construction camp came to the main office it was turned over as was customary to the boss for his consideration. The blank form provided for reporting accidents was properly filled in as follows:

Nature of Accident — Toe crushed.
Name of Man — Jim Kelly.
How Caused — Horse stepped on his foot.
Remarks — You know Jim. The sooner his remarks are forgotten the better for all concerned.

— *Utah Highways.*

C. H. Hudson's Bucyrus 30-B Diesel shovel loading wagons for a fill near Santa Maria, California. This shovel is equipped with a 55 H. P. Diesel engine and is burning 32° gravity stove oil at 7c per gallon delivered.

Mr. Hudson's Bucyrus 30-B high-lift steam shovel, overcasting on the same job. This shovel has averaged 662 cubic yards per shift, including all delays chargeable to shovel, and has run as high as 1700 cubic yards in thirteen hours.

Views on C. H. Hudson's Highway Contract Near Santa Maria, California

Diesel Shovel Operation on a California Highway

Description of C. H. Hudson's Highway Work Near Santa Maria for the United States Department of Agriculture — Outputs and Fuel Costs

ONE of the largest highway construction contracts now under way in California is being done near Santa Maria, by C. H. Hudson, a well-known contractor of Los Angeles. The work is being done for the United States Department of Agriculture, Bureau of Public Roads, and involves 15½ miles of roadway running in an easterly direction through mountainous country, from a point about 18 miles east of Santa Maria. It will eventually connect with a highway running west from Maricopa, and provide a route from the Coast across the Coast Mountain range to the valley beyond.

The country is very rugged, as can be seen from the accompanying illustrations. It is also evident from these photographs that on account of the rough character of the country a great deal of the work is overcasting, although there are a few thorough cuts. Furthermore, on account of fills to be made at some places, it is necessary at times to haul material from the shovels, the average length of haul being 200 to 300 feet. However, the percentage of this class of work is small compared to the amount of overcasting.

The total yardage involved is approximately 625,000 cubic yards, all of which is unclassified. In general, the material varies from ordinary earth excavation to a mixture of earth and rock with some shale, and up to the present writing there have been one or two points of solid rock to go through.

Shovel Equipment

Contract was awarded to Mr. Hudson in February of this year, and shovel operations were commenced the latter part of April, at which time a Bucyrus 30-B high-lift steam shovel on caterpillars was moved in. This shovel is equipped with a 26-foot boom, 17-foot dipper handle and a one-yard dipper. It was erected at Santa Maria and taken in under its own power over approximately 18 miles of road. During the latter part of July a ¾-yard Erie shovel, which is owned and operated by Mr. Jack Dupray of Los Angeles, was started in at another point.

During the last week in September a new 30-B Bucyrus Diesel engine shovel was also put on the work and started at a point several miles ahead of the 30-B steam machine. This made it necessary to move the shovel in under its own power over a mountain road only 10 feet wide and with many curves and steep grades.

Up to the point where the steam machine started operations the highway from Santa Maria is excellent, but beyond this point to a point where the 30-B Diesel engine machine started, involved rather rough going over eight miles of the above-mentioned road. The Diesel shovel was erected at Santa Maria and taken in the entire distance under its own power, although at some places during the last eight miles it was necessary for the machine to do some digging in order to widen out the road sufficiently to permit it to pass.

Climbing 25% Grades

Some of the grades over which the machine propelled itself on this 10-mile road were as much as 20% to 25%, and Mr. Hudson reports that the machine climbed them with ease.

Bucyrus 30-B Diesel Loading Wagons on a Narrow Side Hill Road

Shovel Outputs

Up to October 9, 1923, the 30-B steam shovel had handled about 95,000 cubic yards, and the Erie shovel about 15,000 cubic yards. Most of the time the 30-B worked one shift only, although recently it has been double shifted, and probably will continue to operate two shifts. The number of shifts operated is equivalent to about 5½ months' operation at single shift, including all time whether the shovel was working or not. This gives an average monthly yardage of approximately 17,230 cubic yards, and on the basis of 26 eight-hour shifts per month gives an average of about 662 cubic yards per shift. Considering that this includes all delays, whether chargeable to the shovel or not, it is evident that for a great many shifts the machine handled from 900 to 1000 yards. This was actually the case, and on many days as high as 1100 cubic yards were obtained. The high run for the 30-B steam machine up to this time has been 1700 cubic yards in thirteen hours.

In some places it has been necessary to prepare the material for the shovel by blasting. All drilling for this blasting has been done from the top of the bank, and the average charge of

A Point of Rock Through Which Road Was Cut

Part of Road Built by Hudson's Bucyrus 30-B

Where the Diesel Shovel Was Digging Early in October

Rought Country — The Spout of Steam is the 30-B Steam Shovel in Action

explosive consisted of about 3/10 of a pound of RRP per cubic yard.

The 30-B one-yard steam shovel is equipped as an oil burner and has been using on the average of from four to five barrels of fuel oil per shift.

The 30-B Diesel shovel is using stove oil of 32° gravity, which costs about 7c per gallon delivered at the machine. The Diesel machine has not been on the work long enough to permit any figures being given concerning fuel consumption or output, but judging from similar installations the oil consumption of the Diesel engine will probably be in the neighborhood of two to two and one-half gallons per hour, which will result in very cheap operation.

One reason for the installation of the Diesel machine was the difficulty in securing proper water for the boiler, and for this reason it is the intention of the contractor to keep this machine on sections of the work where water is hardest to obtain. There is a fairly good grade of water available from springs at some points, and the water for the steam machines has so far been obtained from these, although at some points it involves pumping water a considerable distance.

The superintendent, in charge of the work for Mr. Hudson, is Wm. J. Curran. At present the day crew on the 30-B steam shovel is Wm. Fox, engineer, and C. W. Wood, fireman, and the night crew, J. O. Brookbank, engineer, and C. Wiggins, fireman. J. B. Newton is engineer on the 30-B Diesel shovel for the day shift, and J. Johnson is handling the night shift.

1924 Highway Work in California

R. M. Morton, State Highway Engineer of the State of California, advises us that construction work to the total of $5,000,000 for widening and thickening of existing paved state highways will be placed under contract in California within the next few months, plans and specifications for which are now under preparation. In some instances bids already have been called for.

While it is impossible to make a definite statement at this time regarding the location of all of the rebuilding work under consideration, the contracts to be advertised will include paving of some nine miles south of Sacramento on the Stockton route; paving south of Stockton in the Manteca Section; rebuilding of the highway between Oceanside and San Diego; rebuilding of the Rincon Causeway in Ventura County; widening of the highway in the Calabasas Section of Los Angeles County; widening and regrading of the Pacific Highway north of Redding in Shasta and Siskiyou Counties.

Other similar work will be undertaken where the need appears most urgent because of traffic conditions and the necessity for saving old pavements from destruction.

Surveys and plans are under way for considerable work on the main trunk lines in accordance with the announced policy of the Highway Commission and the Engineering Department.

The work in contemplation includes paving of 9.5 miles of the highway immediately north of Redding; grading of a number of units of the Truckee River Route between Auburn and the Nevada state line; work on the Redwood Highway north of Eureka to make a connection with the Oregon State Highway to Grants Pass, and connections with Yuma, Arizona, in Southern California.

There will be considerable shovel work in connection with the widening and straightening of the Pacific Highway between Redding, California, and the southern Oregon boundary and some other construction of this nature on mountain laterals.

Construction of the Dixie Bee Line Highway in Central Alabama

W. T. Taylor Construction Co. of Wilsonville, Alabama, Have Three ¾-Yard Shovels on an Interesting Piece of Road Work on Federal Aid Project No. 99 in Shelby County.

ALONG with other progressive southern states, Alabama is doing her share in the construction of modern highways, linking the adjacent cities, and in some cases serving as the routes over which tourists from the northern states travel to Florida and the Gulf Country. The Dixie Bee Line Highway is such a route, and in addition is the main road between Birmingham, the industrial center, and Montgomery, the state capital of Alabama.

This route is now being rebuilt in order to care for the constantly increasing traffic to which it is subjected. That portion which traverses Shelby County is being built by the W. T. Taylor Construction Company of Wilsonville, Alabama.

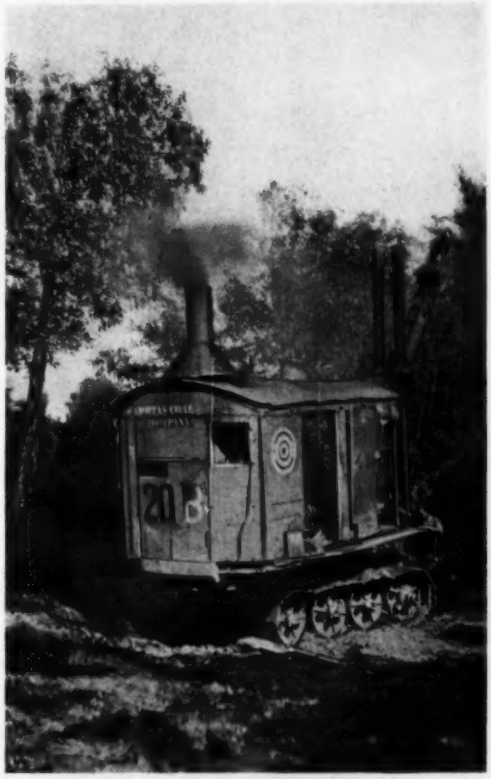
The Shelby County section starts at a point near Acton and extends below Calera a distance of approximately twenty-five miles. The northern half, Section A, runs through a hilly country and involves 171,000 yards of excavation, of which a large part will classify as rock. The other part, Section B, is much lighter work, the excavation amounting to 97,000 yards.

Contract was awarded on January 12, 1923, and operations were commenced on the following day. The grading equipment consisted of three shovels, two Bucyrus 20-B's and one Erie B, in addition to dump wagons and wheelers.

An interesting feature in connection with the relocation of the new route is that a distance of 1.3 miles was saved, and at the same time the new location is never out of sight of the original. The old route followed closely the main line of the Louisville & Nashville Railroad, crossing it frequently. By staying on one side as much as possible and by the use of overhead crossings, four of the grade crossings were eliminated in the relocation.

Care was taken to keep the grades and curves as low as possible, the maximum grade being 6%, and the maximum curve being 18 degrees. All curves above 6% are superelevated. The paved roadway is 18 feet in width. The fills are made 26 feet wide in order to provide 4-foot shoulders, and the cuts are 35 feet wide at grade line in order to provide ample room for ditches. The base course consists of an 8-inch layer of limestone which is covered with a 2-inch wearing surface. On Section A bituminous concrete will be used; on Section B the surface will be Warrenite bitulithic. All paving work was sublet to the J. F. Morgan Paving Company of Birmingham who have had many years of experience in this line of work.

All bridges over 20-foot span were let under separate contract to Mr. J. W. Gwin of Birmingham. The largest bridge on the project is located near Pelham where the new highway crosses the Atlanta, Birmingham & Atlantic Railroad. This viaduct is of reinforced concrete and contains about 3000 yards of concrete and 390,000 pounds of reinforcing steel.



Scott Taylor's 20-B Loading Sprawls

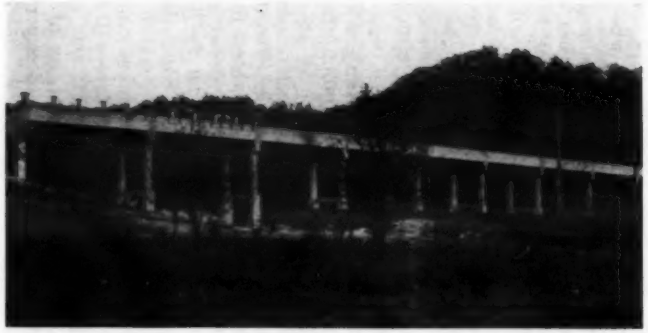
Shovel Work

The shovels were first used to take out the heavier cuts, wheelers being used on the lighter work. Whenever rock was met, it was drilled with steam tripod drills.

After the grading was completed, the 20-B's were used to load limestone sprawls for the base course. This material was hauled in trucks and dump wagons to the subgrade where it was spread and rolled. As the sprawls were obtained from

Arthur Taylor's 20-B in Action in a Borrow Pit

Approach Fill for Pelham Bridge



Pelham Bridge over Atlanta, Birmingham and Atlantic Railroad Tracks

Arthur Taylor's Bucyrus 20-B in a Borrow Pit. Digging Material for Approach Fill for Pelham Bridge

Loading road material for the Dixie Bee Line Highway in Shelby County, Alabama, W. T. Taylor Construction Company, Contractors. Arthur Taylor, the gentleman in the white shirt, is in charge of this operation. The 20-B Bucyrus is loading 1¼-yard Westerns.

various quarries it was sometimes necessary to move the shovels four or five miles, these moves being made at an average rate of a mile an hour where no grading was necessary.

The first 20-B on the work, according to Vader Roberts, its operator, has loaded 588 Western dump wagons, two dippers to a wagon, in 8 hours, including stops for water, and put out 875 yards per day for nine days with a 360-yard haul.

Coal is hauled in trucks to the shovel from nearby sidings. Water is taken from a tank wagon by means of the steam syphon. In commenting on the performance of his 20-B shovel, Mr. W. A. Taylor is quite enthusiastic, stating that the machine has never given trouble, and that with a shovel to load wagons he is able to handle several times the amount of material possible by using the same mules with scrapers.

The W. T. Taylor Construction Company is one of the oldest and best-known road-building firms in Alabama. Mr. W. T. Taylor, the President, is assisted by his sons, S. C. "Chet," W. A. "Arthur," and R. S. "Scott" Taylor, all of whom have served their time in road construction, and are well qualified to carry on this work.

Federal Aid Project No. 99 is under the supervision of Mr. J. H. Mayer, Division Engineer of the Second District of the Alabama State Highway Department. Mr. Marvin Taylor is Resident Engineer.

We are indebted to Mr. Mayer for the above information.

"Yes, We Have No Through Highways"

A stranger tried to cross Kaintuck
On a motor trip.
He soon found he was out of luck,
As tires began to rip.
He fussed and cussed as time went by —
(Time, but nothing more.)
He asked a native where to find
The road, and hear him roar:

CHORUS

Yes, we have no through highways,
We have no through highways today.
Of course, it sounds funny,
But highways cost money,
And nobody wants to pay.
If you'll return in 1950,
You may find us looking nifty
— but NOW it's
Yes! We have no through highways,
We have no through highways today.

— *Scraper.*

Plant of Arkansas City Sand Company

Description of This Plant in Southern Kansas Where a ¾-Yard Revolving Shovel Replaced a 4-Yard Drag Scraper with Satisfactory Results

ROAD-BUILDERS in those portions of northern Oklahoma and southern Kansas that are within a radius of 150 miles of Arkansas City, Kansas, are undoubtedly familiar with the excellent qualities of the product of the Arkansas City Sand Company of that city.

The deposit which is situated at Silverdale, about 10 miles east of Arkansas City within a few miles of the Oklahoma border of the state of Kansas, was originally operated by a company organized in 1921. After about four months' operation during which the company lost money, the plant was shut down. In December, 1922, control was acquired by The Arkansas City Sand Co., composed of Messrs. N. C. Dunn, J. G. Ambrose and Fred Barnes of Arkansas City, a partnership with offices in that city. New machinery was installed and operations started on a scientific, up-to-date basis.

The product is an angular flint gravel, especially suited to road-building and paving purposes, which stands all Federal Aid and other tests. Its market has been growing rapidly in this territory.

The Property

The property covers an area of 400 acres with an estimated deposit of 3½ million yards of gravel, 1½ acres of which have already been excavated. The plant has connections with the Missouri Pacific Railroad at Silverdale, with switch connections with the Midland Valley Railway Co., so that it is well served as far as that most important element, transportation, is concerned.

Operation is simplified by the fact that there is no overburden to complicate matters. The depth of the deposit is from 5 to 20 feet.

The pit is a mile and a quarter from the washer, being connected therewith by a dinkey railroad. The washer connects with the main line with a standard gauge spur.

Revolving Shovel Replaces Drag Scraper Outfit

The operation is of interest from the point of view of excavation, by reason of the fact that the method of mining the gravel was radically changed by the new partnership as soon as they acquired control.

Under the former management the gravel was excavated by a drag scraper operating a 4-yard bucket. The material proved to be too hard for this machine. The bucket either could not bite into it, or would fail to hold the material. It proved too light for the service.

Shortly after the reorganization, the company purchased a new 20-B Bucyrus revolving steam shovel mounted on caterpillars and equipped with

20-B Bucyrus loading flint gravel into 4-yard Western dump cars for the Arkansas Sand Company, Silverdale, Kansas. This shovel replaced a 4-yard dragline in this plant and materially increased its output.

Washing Plant and Storage Bins, Arkansas City Sand Company

Mr. N. C. Dunn, General Manager of the Company

Everett Wolf, Operator of the 20-B, and His Fireman

a ¾-yard dipper. This shovel was put to work late in December, 1922.

The result was that the output of the plant was immediately increased, materially due to the fact that the shovel was found able, by virtue of its greater power, to handle material readily which the light drag scraper was incapable of digging. The material was a heavy gravel formation in a bank, intermixed with clay.

At present the shovel is handling from six to eight hundred tons per day making three or four hundred tons of washed material, whereas under the old management the best the discarded machine could do was to send 300 tons per day to the washer.

The shovel has sent 900 tons of gravel to the washer in an eleven-hour day, the lost digging time, due to shifting trains and waiting, amounting to perhaps one-third of the time.

The deposit is very well adapted to shovel operation. In the first place the pit is not subject to flooding, which is so frequently a reason for installing a dragline excavator. The country is rolling and pit is about 100 feet above creek.

Furthermore, there is no overburden to strip which calls for a machine with a wide operating radius. Again, the gravel runs comparatively clean. A few small tongues of potters' clay do occur, but these are thrown into the cars and sent to the washers with the gravel. No cleaning of the screens is necessary as the gravel is cleaned by the washers before it goes to the screens.

The bottom of the deposit, although not flat, does not contain deep pockets of gravel which are lost to the shovel. Although some points are deeper than others, all the gravel is taken out. The pit is drained by ditches and the deeper spots are pumped out.

The shovel loads four-yard two-way Western dump cars. These cars are made up into two trains, eight cars to a train, and are hauled by two 18-ton Davenports. The haul, as stated, is a mile and a quarter.

The Plant

The cars dump their loads on to an inclined platform or hopper from which the material is delivered to the washers by gravity, aided by a jet of water from a three-inch hose.

The washers discharge on to a 30-inch conveyor belt with 125-foot centers. This belt feeds the gravel over a grizzly to a 48-inch x 18-foot revolving screen arranged over the bins.

The gravel is separated into three sizes: three-eighths inch and under, quarter inch to one inch, and quarter inch to two and a quarter inches.

The washing arrangement consists of two pairs of steel logs, 32 feet long with 105 paddles to each log.

From the bins the various grades of washed and screened gravel are spouted to the cars.

The water from the washing plant is pumped from a nearby creek by a 60 H. P. distillate engine. Two similar engines of the same horse power furnish power for the plant.

The daily capacity of the plant at present is 400 tons.

The plant is under the direction of Roy Fresh, superintendent; Everett Wolf is the shovel operator.

As may be seen from one of our views, Mr. N. C. Dunn gives his personal attention to operations and is very much on the job. We are indebted to him for the information contained herein.

In addition to this plant, the Arkansas City Sand Co. has a sand plant at Arkansas City, Kansas, and are thus able to supply both sand and gravel to a wide trade territory. This sand plant has been in operation for some twenty years. The Arkansas City Sand Company is one of the best known plants in this part of the country.

Street Widening in Long Island City

Queen's Boulevard, the Main Artery from New York into Long Island Is Being Widened from 40 to 200 Feet — Description of Shovel Work Involved

THERE is scarcely a large city in the country at the present time which is not being forced by the alarming increase in motor traffic to relieve the growing congestion by one means or another.

Long Island City has been up against just such a problem. The main motor artery to all of Long Island is Queen's Boulevard. This highway takes the tremendous traffic from the Queensborough Bridge. The congestion has become so serious that hardly a day passes without an accident being reported, resulting from this condition.

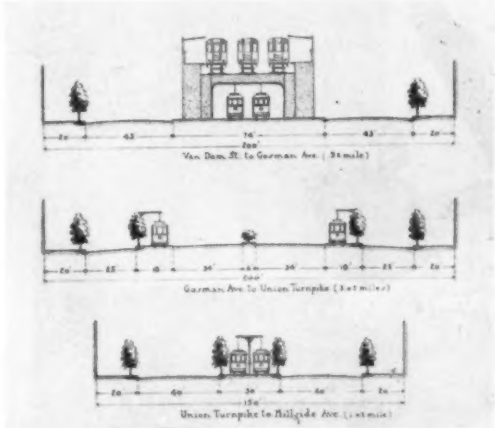
With the end in view of correcting this condition, the Borough of Queen's has determined upon the widening of Queen's Boulevard and its approaches from Queen's Plaza, Long Island City to Jamaica, a distance of 7 miles. Queen's Boulevard, it might be explained, begins at Queen's Plaza, which is the Queen's Terminal of the Queensborough Bridge.

Widening Operations, Queen's Boulevard, Long Island City

The accompanying sketches indicate how the completed work will appear. From Van Dam Street to Union Turnpike, a distance of .91 of a mile, the Boulevard is being widened from 40 feet to 200 feet. From there to Hillside Avenue the final width is to be 150 feet, and all approaches will be widened proportionally.

The work is divided into three sections of 1 mile, 4½ miles and 1½ miles in length.

To the Arthur A. Johnson Corporation of Long Island City has been awarded the task of widening the section from Gosman Avenue to Union Turnpike, a distance of 4½ miles. This contract involves the handling of approximately 450,000 cubic yards of excavation, and is the only part of the work involving heavy excavation.



As Queen's Boulevard will appear when the widening operations are completed. Van Dam Street to Gosman Avenue is .91 mile, Gosman Avenue to Union Turnpike, 5.05 miles, and from there to Hillside Avenue, 1.02 miles.

As may be seen from the sketch herewith the 25-foot roadways adjoining the curb on either side are intended for heavy traffic, whereas the 34-foot roadways on either side of the parkway in the center are provided for faster traffic.

The Excavation Work Involved

The excavation is heavy and has called for a variety of shovel equipment. The heavy work is being handled by a 30-B Bucyrus equipped with a one-cubic-yard dipper. This digging, according to Mr. Arthur A. Johnson, president of the company, is an exceedingly tough formation of hardpan, as far as digging quality is concerned it is no less difficult to handle than boulders buried in concrete. The shovel is turning out somewhat in excess of 400 cubic yards of this material per day. Incidentally, it is interesting to observe that the crew to whom Mr. Johnson has entrusted this work, which is the backbone of the job, has been with his company since 1915.

The lighter digging is being handled by two Osgood 18's and a ¾-yard P. & H. gasoline shovel.

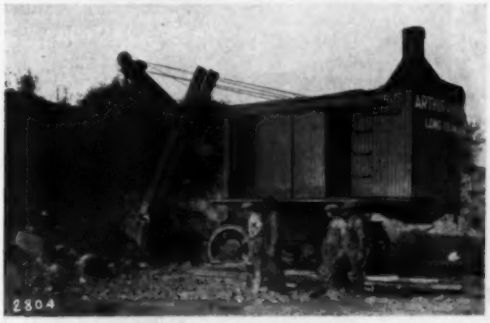
Serving this equipment are four 6-ton Vulcan locomotives and 22 Koppel 4-yard dump cars.

Queen's Boulevard as it looks at present. This 40-foot roadway is to be widened to 200 feet. This view was taken looking west.

The trucking is being done by a subcontractor, Michael J. Torpey of New York, who is using 27 4-yard Pierce-Arrow and Mack trucks.

The excavated material is being used for filling purposes; the haul for the trucks being 1½ miles and the Koppel cars between 500 and 700 yards.

One mile on another section has already been completed. This section was in the hands of the



Watching the Bucyrus Get a Mouthful — Note Heavy Boulder Formation

Borough Asphalt Company of Brooklyn; the excavation was very light.

The remaining 1½-mile section is in the hands of Welsh Brothers, Long Island City, and consists of widening Queen's Boulevard to 150 feet.

In the Arthur A. Johnson Corporation the Borough of Queens has a seasoned contractor. For years this firm has been active in all kinds of excavating, grading and coal stripping, as well as a good proportion of construction operations. At the present time they are engaged on the con-

struction of a 100 x 300-foot foundation for a new exchange building for the New York Telephone Company on 13th Street and 2nd Avenue, New York City, at a cost of $350,000, involving about 25,000 cubic yards of general excavation and the sinking of 91 caissons of rock to an average depth of 32 feet below the general excavation.

In addition, this active organization have in hand numerous other jobs, among them being a coal-stripping contract for the Oak Run Coal Company at Jermyn, Pennsylvania, and a 3½-mile concrete road in Ulster County, New York, at a price of $120,000.

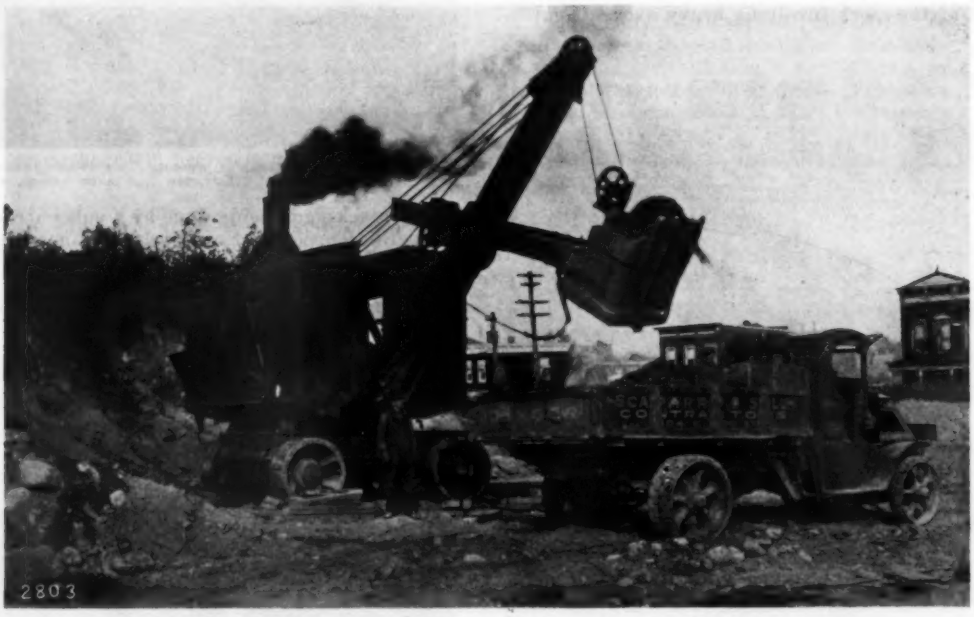
All operations are under supervision of A. D. Saunders, vice-president and general manager.

Arthur A. Johnson is the president of the company. M. C. Dempsey is secretary.

Maurice E. Connolly is president of the Borough of Queens, Clifford B. Moore, consulting engineer, James Rice, borough engineer and James J. Blake, engineer of highways.

The veteran crew on the Bucyrus referred to above are Tom Cavanaugh, engineer, and Frank Gillar, fireman. Harry Downing and George MacInerny are operating the Osgoods and Eric Nelson is on the gas shovel.

We are indebted to Mr. Johnson for the data contained herein.



The Arthur A. Johnson Corporation's 30-B Bucyrus Loading a Mack Truck

Pulling St. Clair County, Alabama, Out of the Mud

Description of a Federal Aid Project in Central Alabama. How a Caterpillar Shovel Did Work Wheelers Could Not Do in a Sticky Fill

TO anyone who has motored in Central Alabama the name of St. Clair County is synonymous with bad roads. The Birmingham to Gadsden Highway crosses this county and in former times has been avoided by motorists whenever possible.

Contract was let last summer by the Alabama State Highway Department for the construction of an improved road through St. Clair to connect with the well-maintained roads in Etowah County on the north and Jefferson County on the south. This road is known as Federal Aid Project No. 124 and is approximately 30 miles long, being divided into sections A and B.

Section B was awarded to Donahoo & Company of Tuscaloosa, Alabama.

Section A was awarded to Phillips & Company of Birmingham, Alabama. This section is 16.3 miles long and extends from the Etowah County line to a point near St. Clair Springs. It traverses a rolling country and involves many cuts and fills, most of which would be too light for a heavy shovel, but are well suited to a small caterpillar shovel. The total amount of grading involved is

A Tripod Drill Was Used Where Rock Was Encountered — This Shows the Character of Boulders on a Typical Cut

Another View of the Fill Looking North, Showing the 10-foot Berm Built by the 20-B

The Fill Looking South Nearly Completed, Borrow Pit Cut by Shovel to Right — Note Wet, Muddy Bottom

20-B Bucyrus Throwing Up the Fill Shown in Accompanying Views

Building a 30,000-yard Fill Across Spring Creek Bottom — Wheeler Operation Gave Way to Shovel Operation Due to Sticky Clay

Phillips & Company's 20-B Bucyrus Taking Out a Cut on Federal Aid Project No. 124 in St. Clair County, Alabama. Widening Present Road with a Side-Hill Cut.

120,000 yards, of which 28,000 yards is estimated to be rock, and 42,000 yards of chert.

The roadway will be formed of local chert, which is laid to a depth of 9 inches and rolled to 6½ inches. It is 18 feet wide and 4-foot shoulders are provided on fills.

Work was commenced in August and steady progress has been maintained to date. Two camps have been established, one near Caldwell and one at Ashville.

Excavation Work

The equipment used on this work consists of one 20-B shovel, eight 1½-yard dump wagons, one road machine, wheel scrapers and 57 mules. A

Phillips & Company's 20-B Bucyrus overcasting. It is shown making the bottom of the fill shown in our other views. This photograph indicates the muddy character of the bottom.

traction engine with tripod drill is used where rock is encountered.

An interesting use for the shovel was found in constructing the fill across Spring Creek bottom. This fill is nearly 1/3 of a mile long and contains about 30,000 yards. The bottom land is boggy and wet, and contained several ponds where previous borrow pits had been made. It was originally planned to use wheelers in making this fill, but due to the tenacious character of the clay it was difficult to secure a full load, and in addition the mules could not secure a good footing.

The 20-B was used to cut a borrow pit alongside the fill, leaving a 10-foot berm, and casting the material inside the slope lines. Due to the width of the shoulder and height of the fill it was necessary to handle much of the material more than once, the first cut being taken from the borrow pit and piled on the berm, placing as much as possible inside the slope lines. The shovel was then operated on the berm and placed the excavated material inside the lines. A road machine was used to shape the fills.

In order to reach the work it was necessary to unload the shovel at Caldwell, Alabama, on the Southern Railway and move it about six miles. Three miles of this move was through timberland and across fields, as no road was available. During this move Canoe Creek was forded, the caterpillars having ample power to walk across and climb the banks.

Water is hauled to the shovel from nearby streams. Coal is hauled from nearest rail points.

Phillips & Company is a partnership, composed of the two brothers, C. J. "Captain Jack" and W. L. "Warner" Phillips. Both of these men are old experienced dirt movers, having built many miles of railroads and highways in the South. When Captain Jack is not busy trying to make an estimate, you can probably find him somewhere in the woods following his fox hounds, of which he has a large pack.

F. J. "Fred" Bradshaw is piloting the 20-B assisted by Vince Brannon, who keeps things hot. According to Fred, the 20-B "is there" when it comes to hard digging.

P. J. Mack is general foreman of wheelers.

This project is in District No. 2 and under the supervision of Mr. J. H. Mayer, Division Engineer. Mr. J. C. Steele is Resident Engineer.

We are indebted to Mr. Mayer and Mr. Phillips for the above information.

Some Highway Statistics

The figures which we give below will give some conception of the magnitude that road building has assumed since the War. Here is the mileage and cost of Federal Aid projects alone from 1918 to 1923 inclusive. The fiscal year of the Government ends June 30th. These figures were supplied by Thos. H. MacDonald, Chief of Bureau of Public Roads, Washington:

	Total Cost	Federal Aid	Miles
1918.....	$ 257,731.37	$ 112,256.98	12.5
1919.....	2,124,873.48	768,472.17	176.8
1920.....	7,405,000.53	3,159,790.53	716.1
1921.....	42,149,181.36	18,462,089.99	2,898.5
1922.....	188,965,646.43	79,816,175.60	9,519.3
1923.....	166,802,207.97	71,681,382.67	9,973.9
	$407,704,641.14	$174,000,167.94	23,297.2

The latest available figures of the Bureau of Public Roads as of September 30, 1923, indicate that $35,196,489.99 has been approved for Federal Aid projects during the year for a mileage totaling 4,131.1. During the fiscal year ending July 1st, 9,078.6 miles of Federal Aid road were completed or placed under construction. Up to July 1st, 41,308 miles were completed or placed under construction. Fourteen states have a Federal Aid mileage of 1000 or over. The first ten ranking states in Federal Aid mileage are as follows: Texas 3841; Minnesota 3532; Iowa 2071; Nebraska 1982; North Dakota 1641; Georgia 1615; Wisconsin 1356; Missouri 1247; South Dakota 1239; South Carolina 1168.

During the year 1922 the states, counties, towns and districts expended for the construction, maintenance, engineering and administration of the roads located outside of the limits of incorporated towns and cities, a total of $898,352,307 of which $429,896,572 was expended by or under the supervision of the respective state highway departments and $468,455,735 was expended by the local communities without state supervision. Aside from maintenance and repair work the tangible results of this expenditure wa 34,456 miles of surfacing, 8,883 miles of earth roads constructed to definite grade with permanent drainage structures and 34,983 miles partly graded and drained. The mileage of the different types of surfacing are as follows: Sand clay, 4,477.5 miles; gravel, chert, shale, etc., 17,479.9 miles; waterbound macadam, 3,358.7 miles; surface-treated macadam, 613.5 miles; bituminous macadam, 1,811.1 miles; bituminous concrete, 1,020.4 miles; portland cement concrete, 4,958.7 miles; brick, 249.3 miles; miscellaneous and unclassified types, 487.2 miles.

Indiana Road Show

The Tenth Annual State Road Show will be held at Purdue University, Lafayette, Indiana, January seventh to eleventh inclusive. All of the county road superintendents, county engineers, surveyors, and street commissioners are obliged to attend this school and take part in the program.

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Bradlee Van Brunt, Manager and Editor

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Two Great Canadians

Two great Canadians died within five days of each other during the past month, on December 5th, Sir William MacKenzie, and on December 10th, Lord Shaughnessy.

The former is well known to our readers as one of Canada's greatest contractors. In partnership with Sir Donald Mann he put through the Canadian Northern Railway. Earlier in his career he was instrumental in building the Canadian Pacific through the Rockies.

Lord Shaughnessy, was Chairman of the Board of Directors of the Canadian Pacific Railway and at one time President. He is known as one of the makers of Canada. He rose to president of the Canadian Pacific Railway from clerk in the Purchasing Department of the Chicago, Milwaukee & St. Paul Railway.

Highway Excavation in 1924

THE *Excavating Engineer* has obtained from the Highway Departments of the various states and the Provinces of Canada, figures on the prospective road and highway construction in 1924, together with the amount of excavation involved. Furthermore, we have included as far as possible estimates on the percentages of this excavation which will be adapted to shovel work. At the time when these figures were received, in December, some states had not as yet prepared their schedules, consequently in a few instances this review is not as complete as it might be. We believe that it gives as clear, concise and comprehensive an idea of the prospects for shovel owners as can be obtained at this time.

It must be remembered, however, that although these figures include Federal Aid and State Work in the great majority of cases, and county work when available, there undoubtedly will be a very large amount of shovel work developed within the next few months that is not covered under these three main classes. Furthermore, it is quite likely that a considerable amount of borrow pit work has not been included in the shovel work estimates of the various engineers. It has often been said that construction is this country's greatest business next to agriculture, and road-building has grown to be the most important part of construction. This may be understood when it is realized that one-half billion dollars represented the total Federal and State appropriations for highway work in 1923.

Alabama

150 miles of road and highway projected for 1924, costing approximately $3,000,000.

100 miles, which has already been approved, will actually be done the forthcoming year, costing $1,500,000.

The amount of excavation that will probably be required on a rough estimate will be 1,875,000 cubic yards, of which 150,000 can be worked with steam shovel.

Arizona

This state has not determined as yet the 1924 road program, although the Governor proposes a $20,000,000 bond issue for upwards of 450 miles of construction. This, however, requires an amendment of the present highway bill and special elections.

Fifteen miles of hard-surfaced roads and 135 miles of gravel roads, already approved, will be done in 1925, involving 300,000 cubic yards of excavation, a very small portion of which will be suitable for shovel operation.

Arkansas

The projected amount of highway construction for 1924 will amount to $9,000,000.

$5,000,000, already provided, will be completed.

The amount of excavation will be approximately $3,500,000. About 2% will be steam shovel work.

California

The detailed program for 1924 highway construction is not announced, however, the Commission reports that a total of $5,000,000 for widening and thickening of existing paved streets and highways will be placed under contract within the next few months. Funds will be derived from the state's share of the new gasoline tax and motor vehicle license fees. The Commission will receive its first allotment from the gasoline tax in May. Funds for primary construction, as distinguished from maintenance and rebuilding, consist largely of uncollected Federal Aid allotments. Surveys and plans are under way for considerable work on the main trunk lines. Considerable steam shovel work in connection with the widening and straightening of the Pacific Highway between Ridding, California, and southern Oregon is projected. There will also be other construction of this nature on various mountain laterals, the yardage of which is not available.

Colorado

According to L. D. Blauvelt, State Highway Engineer, $9,000,000 will be available for road work. This is divided as follows: For maintenance, $700,000; $3,300,000 for construction by the State Highway Department including all Federal Aid; $2,500,000 for construction.

work by counties and a like sum for unfinished state work.

It seems impossible to make an estimate of the yardage of excavation of the shovel work involved at this time, although it will undoubtedly run high.

Connecticut

Funds for road work are appropriated for a two fiscal year period. It is estimated that $15,000,000 will be available for the next two years for carrying on the work of the department. A very comprehensive and active road-building program has been prepared for the year ending June 30, 1924. This envolves new roads and reconstruction work on the main thoroughfares.

Delaware

Approximately 70 miles of Federal Aid, state and county construction is projected for the forthcoming year, involving from 3,000 to 5,000 cubic yards of excavation per mile. At a rough estimate 10% of this will be steam shovel work. 100 miles of work is now under contract.

District of Columbia

Funds appropriated by Congress by fiscal years beginning July 1st. Funds for 1924 not known. Current year's work 95% completed. At a rough estimate 150,000 cubic yards of grading, 80% of which will be steam shovel work will be done.

Florida

Budget not prepared until January. The Highway Department will have $5,000,000 for expenditure, and it is estimated that there will be about 2,000,000 cubic yards of excavation, about one-third of which will be steam shovel work.

Georgia

Report not received in time for publication.

Idaho

The estimated state, including Federal Aid, work will amount to $2,500,000. No information at this time on county work. $2,500,000 of work has already been authorized. Contracts have been let and excavation is about 50% complete. There are no estimates available on the amount of excavation work on the above.

Illinois

1000 miles of concrete on state bond issue system including Federal Aid and 150 to 175 miles by County Boards involving 5000 yards of excavation per mile. 200 to 275 miles of heavy grading involving from 2,000,000 to 2,500,000 cubic yards. This includes work carried over from 1923.

Indiana

A hard-surfaced road program of approximately 400 miles is contemplated; 400 miles of work will also be done from funds already approved.

2,000,000 cubic yards of excavation, of which 20% will be steam shovel work, will be involved in this program.

Iowa

Report not received in time for publication.

Kansas

Approximately 150 miles of road will be put under contract, upon all of which there will be excavation. The excavation will probably run 1,000,000 cubic yards. It is impossible to estimate the proportion of this that will be adapted to shovel work.

Kentucky

It is probable that 300 miles of highway will be built; 250 miles of the work to be actually done have been approved.

About 3,000,000 cubic yards of excavation will be necessary in the 300 miles of construction, about 800,000 cubic yards of which will be steam shovel work.

Louisiana

At a rough estimate 700 to 1,000 miles of road and highway construction is projected for 1924, involving probably 4,000,000 cubic yards of excavation. It is said that there will be no steam shovel work, but about half of the above will be adapted for dredges. From 600 or 700 miles of highways are now under construction, about 400 miles of which will be completed in 1924, all of which has been contracted for. This involves about 3,000,000 cubic yards, about half of which is dredge work.

Maine

75 to 100 miles of state highway and Federal Aid construction will be on the 1924 program, about 50% of this mileage has been already approved as Federal Aid Projects. Considerable excavation will be involved. During the last three or four years contractors have used steam shovels on practically every state highway and Federal Aid Project. The grading usually runs better than 3,500 yards per mile.

Maryland

$5,000,000 authorized for 1924, which will call for 500,000 cubic yards of excavation. At the present price of labor all excavation is considered steam shovel work. However, perhaps half of this amount is normally considered so. There is practically no work authorized in 1923 which will be completed in 1924.

Massachusetts

No authoritative information will be available before April 1st.

Michigan

1200 miles of highway construction is projected for 1924, including Federal Aid, state and county work, which will involve excavation amounting to 5,000 cubic yards per mile, 10% of which will be suitable for steam shovels. Information in regard to the work that has been authorized in 1923 for completion in 1924 will not be available until January first.

Minnesota

$32,500,000 will be available for Federal Aid, state and county construction during 1924, calling for 12,000,000 to 16,000,000 cubic yards of excavation, of which probably 6,000,000 will be suitable for steam shovels. This is the closest possible approximation the Minnesota Highway Department can make at this time.

Mississippi

The amount of work projected is $2,000,000. $6,000,000 has already been approved, most of which was contracted recently. It is estimated that 5,000,000 cubic yards of excavation will be involved. The shovel work will probably run about a half a million yards, most of the excavation being light.

Missouri

$16,000,000, involving 1100 miles of graded earth and pavement, will be carried over into 1924 as uncompleted work. New work anticipated is $15,000,000. Between ten and fifteen million cubic yards of earth will have to be moved during the year, from one to five per cent of which will be adaptable to steam shovels.

Montana

Road work under the supervision of the State Highway Department is restricted to Federal Aid. The state has insufficient funds for construction purposes. $250,000 of highways and bridge improvements are contemplated, involving the excavation of between one and two million cubic yards of material. The amount of shovel work will be small, probably not over 100,000 yards, most of the work being adapted to fresnoes and elevating graders.

Nebraska

$2,400,000 worth of work will be contracted during January and February for 1924 construction. This will involve $4,000,000 cubic yards of excavation, mostly light work.

Nevada

The 1924 construction program of this state is not complete or ready for publication at the time that this issue goes to press.

New Hampshire

30 miles of Federal Aid and 40 miles of state aid projects involving about 150,000 cubic yards of excavation are projected. 25,000 cubic yards could be classed as steam shovel work. This will call for an expenditure of about $2,500,000 for maintenance and construction.

New Jersey

1924 program not approved as yet. New construction will be limited to $6,000,000 available for roads and $2,000,000 for bridges in addition to the new Perth Amboy Bridge, a 3 to 4-million-dollar project. Past experience shows that 4,000 to 8,000 cubic yards of excavation is required on reconstruction work and more on new work. Shovels will probably be used on nearly all work.

New York

A tentative program is now being prepared.

New Mexico

No report received.

North Carolina

About 800 miles of work is projected for the forthcoming year, 500 of which will be hard surfaced. It is impossible to make any estimate at the present time of the amount of excavation involved.

North Dakota

400 miles of earth grading including culverts, bridges, guard rails, rip rap, etc.; 150 miles of gravel surfacing to the amount of $2,500,000. The above involves about 2,500,000 cubic yards of excavation. The amount of work contracted for up to this time is approximately 120 miles of earth grading and 50 miles of gravel surfacing, which will be carried over to 1924. The above will include 300,000 cubic yards of excavation. In both cases the use of shovels is largely a matter of choice with the contractor.

Ohio

It is too early for the Department to give any actual figures for 1924. However, it is estimated that 800 miles of Federal Aid, state and county work will be done, calling for about 2,900,000 cubic yards of roadway excavation at 66c, and 300,000 cubic yards of bridge excavation at an average cost per yard of $1.40. At a rough estimate about 25% of the above mentioned will be steam shovel work. 887 miles are now under contract incompleted. About 236 miles of this will require roadway and bridge excavation, involving about 1,000,000 cubic yards for the former and 100,000 cubic yards for the latter, about 50% of which will be steam shovel work.

Oklahoma

275 miles of Federal Aid work let in 1922 and 1923 are being carried over for completion. 197 miles of work remain to be let. The 275 miles above involves about 2,500,000 cubic yards of excavation, very little of which will be steam shovel work. This covers Federal Aid work only.

Oregon

$10,000,000 is available for Federal Aid, state and county construction, with 3,000,000 cubic yards of excavation involved, of which 500,000 cubic yards will be adapted for shovel work. $6,000,000 included in the above $10,000,000 has already been contracted for, involving 2,000,000 cubic yards, of which 300,000 cubic yards is shovel work.

Pennsylvania

The program consists of 275 miles on the primary system and 225 miles on the secondary system. In addition 80 miles of contracts will be carried over from 1923, making a total of 580 miles of construction. Practically all of the above will require excavation with a probable total in the neighborhood of 2,750,000 cubic yards. At least 75% will be work on which steam shovels could profitably be used.

The above figures will be increased materially by the $50,000,000 bond issue passed by the voters on November 6th.

Rhode Island

Funds available but not accurately known; however, it is estimated that about $1,700,000 will be available. Forty three miles of road will be paved. 250,000 cubic yards of excavation will be required in connection with the program, practically all of which will be handled with steam shovels.

South Carolina

No official report received as we go to press.

South Dakota

300 miles of Federal Aid calling for 2,835,000 cubic yards of excavation, 250 miles of State Aid calling for 950,000 cubic yards of excavation, and 1,800 miles of county work with 9,950,000 cubic yards of excavation is projected. This totals 13,735,000 cubic yards. Of the above 325,000 cubic yards is shovel work. 116 miles of work in addition has already been contracted for and will be completed in 1924. This will involve 1,096,000 cubic yards of excavation, of which 180,000 will be steam shovel work.

Tennessee

The 1924 program includes approximately 600 miles, of which probably 100 miles is re-oiling. It is expected that $9,000,000 will be available for new work. This includes unexpended 1923 funds, anticipated state funds, Federal Aid and county co-operation; about one-third will be spent on excavation. The prices will vary from 45c to 60c per cubic yard. It is estimated that steam shovels can be used to advantage on more than 100 miles. This report is made early in December and states that the above includes work that may be let in December.

Texas

$30,000,000 is projected for road and highway construction. The amount of work that has been approved and will be done in 1924 will be about $20,000,000. The above work will require about 3,000,000 cubic yards of excavation. The amount of shovel work involved will be small.

Utah

County mileage not known. Under Federal Aid the 1924 program will call for 208 miles of gravel surfacing at about $8,000 per mile and about 15 miles of concrete at $30,000. Bridges will cost about $100,000. Excavation will be close to 1,500,000 yards consisting of common, rock and borrow. About one-fifth of this will be steam shovel work. 120 miles was authorized in 1923 at an estimated cost of $2,036,457.95, approximately 65% of which is now under contract. The excavation will amount to 900,000 cubic yards. Of this 50,000 yards at Riverdale and Ogden will be steam shovel work. Of the balance the steam shovel work will probably not exceed 20%, except at Windover Loop, on which there will be 345,000 cubic yards of dragline excavation.

Vermont

Six to eight hundred thousand dollars of Federal Aid work will be done in 1924 in addition to $600,000 of work approved in 1923. Probably $100,000 will be used

for excavation, including earth, rock and gravel, 75% of which will be steam shovel work. State highway work is largely in the hands of towns and cities, and is carried out according to the requirements of the State Highway Department, plans for which are not made until early in the season.

Virginia

Figures made public by H. G. Shirley, chairman of the State Highway Commission of Virginia, indicate that $13,000,000 will be available for highway construction in that state during 1924. Of this amount, $8,000,000 will be carried over from the current year.

Washington

51 miles of concrete paving and 260 miles of grading and surfacing with gravel or crushed rock are planned. About $6,470,000 is available for this work. $1,500,000 will be expended for maintenance. Contracts have been let for about 110 miles of grading and surfacing with gravel at $1,676,000, which will be done in 1924.

The 1924 mileage given above will involve about 2,000,000 cubic yards of excavation.

West Virginia

About $5,000,000 will probably be spent for highway construction for 1924, about $2,350,000 of which will be spent on excavation. 75% of the above will probably be suitable for steam shovels. $6,000,000 was authorized for 1923, 30% of which will be completed in the forthcoming year. 75% of the above will be steam shovel work.

Wisconsin

Federal Aid work will amount to $1,500,000. State aid work is determined by appropriations voted by County Boards. The state divides $785,000 among the counties, to which they add generally several times the state's figures. The County Boards are now in session. $1,500,000 may be added to the Federal fund.

The counties will probably do about 180 miles of paving, averaging 4,000 cubic yards of excavation to the mile. To this will be added several hundred miles of gravelling, and purely grading work averaging about the same yardage. A large proportion of the last will be done with day labor forces by the counties. Shovels can be used on almost any part of this work. It has been found economical to take out a one-foot cut with a shovel, according to H. J. Kuelling, construction engineer.

Wyoming

1924 construction will amount to $2,000,000 with 400 miles of grading and 220 miles of gravel surface, calling for 2,500,000 cubic yards of excavation. The "carry over" work for 1924 will amount to $2,300,000.

CANADA

It is difficult to give any estimates for the forthcoming year for the nine provinces included in the Dominion of Canada, owing to the fact that fiscal years end on different dates in the various Provinces, and in nearly all of them proposals have not as yet been made nor estimates prepared for the forthcoming year. The following official information, however, might prove of value:

Alberta

No figures available for the forthcoming year. New construction for the years 1920-1923 amounted to $2,766,247. The total mileage in the settled proportions of the province is 140,000, 16,000 miles of which is continuously graded road. 28,000 miles is open to traffic but not continuously graded.

British Columbia

The estimated new construction for the fiscal year 1923-1924 will be $2,015,000 new construction, and $1,326,500 for renewals and maintenance; this is more than any previous year. About 400,000 cubic yards of excavation will be involved, 250,000 yards of which will be shovel work. The total mileage of the province is 15,960 miles.

Manitoba

$7,432,684 has been expended for new constructions under the Good Roads Act of the Province only, from 1920 to August, 1923. There is no record of money spent by rural municipalities, and no estimate is available for the forthcoming year. 190 miles were graded and 318 miles gravelled during 1923. It is estimated that 225 miles will be graded and 550 gravelled in 1924. This Province has 74,000 miles of road, of which 24,600 miles is open to traffic.

New Brunswick

6,000 miles of road were constructed in 1923 and 500 miles improved, all with a good type of gravel. The total expenditure on permanent roads and bridges during the past year was $1,500,000. It is estimated that 1924 will be about the same amount.

Nova Scotia

The 1923 program calls for the completion of 89.2 miles of road partially constructed in 1922. Tenders have been called on 240.3 miles of new work. Of this 106.96 miles has been done by day labor under the supervision of the Construction Department of the Provincial Highway Board and 133.3 were let to contractors in the Province. 252.04 miles are yet to be constructed. Nova Scotia has a total road mileage of 15,000, of which 960 is main trunk road. 3,164 miles of important county and inter-county roads are included in the above total. Of this amount 1,550 miles have been reconstructed.

Ontario

It is estimated that probably a little over $12,000,000 will have been spent on road construction in 1923. During the years 1920, 1921 and 1922, $64,148,252 were spent on county, provincial county, and township roads and provincial highways.

Prince Edward Island

New construction in 1923 will amount to $362,000 including new construction, renewals and maintenance. This province has 3,650 miles of road, of which 300 is improved.

Quebec

The 1924 budget will not be ready until the end of January. 471.5 miles of new construction was completed on main highways and municipal roads in 1923 and 316.5 miles of resurfacing. On November 10th, 183 miles of road were under construction. $51,583,419.44 have been spent by the Government for roads up to December 1st. Quebec has a total road mileage of 45,000 miles, of which 15,000 miles are earth roads and 4,660 gravel macadam, concrete, etc.

Saskatchewan

The amount to be expended on roads will not be known until the legislative assembly has passed on the estimates presented to the House by the Government. It is said that very little shovel work, if any, will be included. The report for the fiscal year which ended April 30th has not as yet been printed. The estimated expenditure for 1923 is $2,118,000. Saskatchewan has an estimated total of 1,075 miles of completed road at the present time. The work on the provincial highway system for this season will consist of completing the unfinished mileage laid out during 1922 and the construction of at least 315 miles profiled for the season of 1923. It is expected that the expenditure on these highways for the full fiscal year will be $1,060,000.

DEVICES YOU OUGHT · TO KNOW ABOUT ·

A ¾-Yard Diesel Engine Shovel and Dragline

The Bucyrus Company has just put on the market another addition to its line of excavating machinery, a ¾-yard shovel and dragline which is operated by a full Diesel engine. This machine is a smaller edition of its 30-B, 1-yard Diesel machine which was announced about a year and a half ago.

The outstanding feature of the machine is the astonishing fuel economy at which it can be operated. The Diesel engine will use any low-grade fuel oil of high-heat value which will flow through the pumps. The cost of this oil varies considerably but in general it may be said that it runs from 1/3 to ¼ that of gasoline.

30-B Diesel machines are now in operation in nearly every district of the United States and many foreign countries with utmost success. Some of the reports relative to the fuel cost are so low, that it can be said in all truthfulness, that this machine is literally creating a new era for excavating machinery as far as the internal combustion engine is concerned.

Conditions of digging and the cost of the oil, as well as the character thereof, vary so greatly that it is hardly well to cite figures of fuel consumption. However, based on past experience

Bucyrus 20-B Diesel High-lift Shovel

with the 1-yard machine, it may be said that under average conditions the 20-B should consume from 1½ to 2 gallons of fuel oil per hour.

The very fact that this machine is equipped with a Diesel engine might possibly lead to the conclusion that the machine is complicated in design. As a matter of fact, the first thing that strikes an experienced steam shovel man in inspecting the 20-B Diesel is its extreme simplicity. As a shovel it is a rope thrust machine. That is to say, instead of being equipped with an independent engine or motor on the boom, or a complicated thrusting device such as chain or belt drive from the main machinery, all of the motions of the dipper are controlled by a small drum mounted under the boom which is turned in either direction by ropes from the main machinery. The dipper is as perfectly controlled as on a steam machine, and furthermore the shovel has even greater power of thrust, with all the force of the powerful main engine behind it.

Bucyrus 20-B Diesel Dragline Straightening a Creek

The main machinery likewise is extremely simple to operate and adjust.

This machine in workmanship and design carries along the traditions of other Bucyrus machines, in that it is of heavy, rugged construction. It is built to operate with equal economy and efficiency under severe digging conditions as well as in average material.

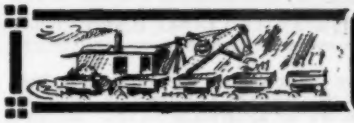
The engine is a 45 horse power mechanical injection, three-cylinder engine, built especially for this service.

The 20-B may be had as a shovel with standard, high-lift or extra high-lift booms, as a dragline excavator, a clamshell excavator with a 35 and 42-foot boom, or with crane equipment.

Bulletin B-201-S, describing this machine may be obtained by addressing the Bucyrus Company, South Milwaukee, Wisconsin. An addressed postal card that may be found in this magazine will serve this purpose.

Stroud and Company Business Continued

The Little Red Wagon Manufacturing Company of Omaha has purchased the business of Stroud & Company of Omaha, and will continue the manufacture of Stroud Road Maintainers, Scrapers, Drags, Plows and other road-making machinery. The new organization will continue the Stroud Parts service. Stroud elevating graders and dump wagons have been built in Omaha for over 25 years. There are a large number of old Stroud graders and dump wagons in use by contractors who will appreciate the continuation of the Stroud Parts service.



SHOTS FROM THE · FIRING LINE ·

Central States Notes

BY M. J. WOODHULL AND F. M. GAYLORD

Boddie and Powell are opening a box cut at their new strip mine near Madisonville with their 50-B equipped as a dragline. A little later when their 80-B comes they will convert the 50-B into a shovel and use it for a loader. So far things have gone very nicely. The overburden is proving somewhat lighter than they expected and at a nature that makes good digging. W. E. Trapnell of steam dipper trip fame is in charge of the 50-B.

The paving of the section of the Dixie Bee line between Howell, Indiana, and the Henderson Ferry landing is completed all but a few finishing touches. The Traylor Construction Company did the job and did it in record time.

George Dempster of the Dempster Coal Company reports things moving nicely at their strip mine at St. Charles, Kentucky.

The Hawley-McIsaac Company is progressing well with their new mine at Lewisport, Kentucky. Several of the buildings are completed, and others are well under way. The water supply system is about complete as is the railroad spur. The 50-B is on the job working and the 320-B expected soon.

The M & M Contract Company of Rockport, Indiana, are just finishing up the last bridge on the new route of the Dixie Bee line between Evansville and Princeton. Some of the nicest looking concrete work in this section can be seen in these bridges.

Eastern States News

BY H. E. HEIDRICH

Haley, Chisholm and Morris, of Charlottesville, Virginia, are operating a Marion 61 on the Chesapeake & Ohio Railroad at Snow Flake, West Virginia. They have it in borrow pit, material being used for fill near Fort Spring, West Virginia. J. E. Shelton of Charlottesville, Virginia, is handling the levers, while Will Thom, formerly of South Milwaukee, Wisconsin, is doing the craning. P. L. Garver is supplying them with the necessary steam.

Mr. G. A. Brooks who is operating a 40-R Bucyrus for the Acme Limestone Co. of Alderson, West Virginia, is keeping the rock moving at their quarry in Snow Flake.

New England States

BY E. B. WILLIAMS, BOSTON

Joseph A. Singerella was awarded contract by the City of Boston School Department for grading the Dillaway School Playground.

The City of Boston Park Commissioners awarded contract for filling and grading Orient Heights Playground to J. C. Coleman & Sons Company at a bid of $17,379.00.

The State of New Hampshire Department of Highways, awarded contract for the construction of highway at Jaffrey, New Hampshire, to Amos D. Bridge's Sons Company of Hazardville, Connecticut.

Bids were opened on December 19th at Providence, Rhode Island, by the Water Supply Board for clearing and excavating on the Scituate Reservoir as an addition to the work now under construction by the Winston Company.

Northwestern States Notes

BY A. B. HANCE, PORTLAND, OREGON

The following is the amount of road work accomplished in this territory during 1923: Oregon, grading and surfacing, 381 miles, paving, 44 miles; Washington, grading and surfacing, 187 miles, paving 37 miles; Idaho, grading and surfacing, 93 miles, paving, 18 miles; Montana, grading and surfacing, 71 miles. The above work has been let during the past year, but of course a great deal of it has not been completed. The State of Washington has finished the 35 miles of paving on the Pacific Highway and there is now one complete stretch of pavement between Vancouver, British Columbia, and the California line.

During 1924, the State Highway Commission Department of the State of Washington plans to start about $5,300,000 worth of work which will consist of 53 miles of paving and the grading of 280 miles. Included in the proposed work will be 50 miles on the Olympic Highway. This will be merely cleared and grubbed in the first contract and prepared for the grading contract to be let probably in 1925.

Fourteen miles of the Yakima-Ellensburg Canyon Road still remain to be graded under contract between the State Highway Department and the Grant Smith Company. Grading is complete on 18.7 miles which are now under contract for surfacing. The three firms holding contracts will continue their work during the winter. In the uncompleted section there is considerable heavy rock work, including two tunnels, one 90 feet and the other 187 feet in length. Root & Joslin have the surfacing of the six miles in the East Selah and their work is more than half done. The contract for surfacing the 12.5 miles from Ellensburg to Umtanum has been let to Carlson & Nyberg, an Oregon firm. Contract for surfacing the 14 miles not yet graded will be let early next year, and the contractors will follow close on the heels of the graders. The whole of the road, 32.7 miles, will be completed and open for travel by midsummer of next year.

W. J. Doust of Spokane, Washington, was awarded the contract for permanent Highway No. 7 in Adams County, Washington. This is a gravel road nine miles long connecting Cunningham and Othello. Work is to begin at once and the road completed by July 1, 1924. The price of the road will be $67,000.

Out on the Ocean Beach Highway, nearly a mile northwest of the Hotel Monticello at Longview, Washington, is a huge Bucyrus dragline excavator that is disposing of the old embankments thrown up years ago at the rate of 1000 yards per day. The numerous ditching machines, steam shovels and track-laying machines operating all over Longview are mere toys compared to their big sister excavator which began operations last Tuesday. The equipment for this excavator arrived in Longview in several cars at different times from October 15th to November 1st. It was brought here from Alberta, Canada, where it was used in Canadian irrigation projects. The machine is fully equipped, having its own light plant, so that three shifts can be worked if necessary. Two shifts are now in operation, two men only being required to prosecute the work, the engineer and oiler, or fireman, the machine being an oil burner. The huge excavator is moved to the required positions on especially turned and seasoned hardwood rollers, six inches in diameter by five feet in length, the foundations for which are 12 x 12 seasoned hardwood timbers, these resting on heavy flat sections of ground timbers that only a steam hoist could handle.

Letting of a contract for grading on the Dalles-California Highway in Klamath County, from Big Marsh to Beaver Marsh, a distance of five and one-half miles, has been announced in Klamath Falls, Oregon. The contract was let to John Hampshire, who is now building the first 30-mile unit of the Klamath Lake route. Work will be started at once.

Road construction work in north Idaho, representing a total expenditure of more than $1,700.00 for 1923, will be completed by January 1st, and contracts for $1,000,000 more work for 1924 will be let before that time. Ten miles of the North and South Highway in the Potlatch District in Latah County was let November 26th. This will cost approximately $90,000. Contract for the paved highway in Shoshone County, between Kellogg and Mullan, 17 miles, to cost about $700,000, will be let this year, and work will be started as soon as possible next year. The Moyle project from Bonners Ferry to Leonia, 15 miles, at a cost of $210,000, will also be finished by the first of the year.

S. S. Shell, contractor of Oakland, Oregon, offered the best proposal on the ten-mile stretch of grading between the top of the Siskiyou Mountains at the Oregon state line and the Klamath River in Siskiyou County, California, to the State Highway Commission at its meeting here. His offer to do the work for $192,864 was the lowest bid offered. The road through this section is narrow and in places has some heavy grades. The work involves eliminating the sharp angles and short curves and grading the whole road to a width of 24 feet. Practically all of the Pacific Highway between Redding and the Oregon state line, excepting the 22 miles already paved, will be rebuilt during the next two years.

The Oregon State Forest service has agreed to construct an extension of the Mount Hood Loop Road to Cloud Cap Inn during the season of 1924. Forest reserve funds will supply the money, at an estimated cost of $90,000.

Bids for about 23 miles of new construction on the Idaho-Pacific Highway in Twin Falls and Cassia Counties, between Hansen and Burley, will be asked for about the middle of January. This project will be the major part of the winter's work contemplated by the Highway Bureau, and will cost about $210,000. Funds will be furnished by the counties and highway districts involved, and by the Federal Government. The road will be gravel surfaced. This highway, which consists of 14 miles in Twin Falls County and nine in Cassia County, has never before been improved.

Pacific Coast News

BY P. H. BIRCKHEAD, C. W. WHITNEY AND JACK SACKETT, SAN FRANCISCO, CALIFORNIA

Contract awarded by Northwestern Pacific Railroad Co., 64 Pine Street, San Francisco, to W. A. Bechtel, 625 Market Street, for widening 1190-foot tunnel from single to double track, Breenbrae Tunnel, Marin County. Plans being made by Engineering Department of above railroad for widening to double-track various other tunnels.

Bids will be called for early in January, 1924 by the District Engineer, Bureau of Public Roads, United States Department of Agriculture, No. 9 Main Street, San Francisco, for the construction of the Yuba Pass National Forest Highway Project, construction to be done during the 1924 season. Work involves the following approximate quantities: 10 acres clearing, 135,000 cubic yards excavation, 310 cubic yards concrete, 3,500 lineal feet corrugated metal pipe. This project consists of a large quantity of team work; some light steam shovel work, and highway is at all points near a good mountain road. There are 500 stations of team work. Plans and specifications may now be obtained from the Bureau of Public Roads, above address.

T. V. or Happy Cromwell is operating the 30-B Bucyrus shovel for the Western Construction Company on their project known as Hollywood Lands. Happy's address is 5453 Russell Avenue, Hollywood.

Leo J. Gibbons is making the dirt fly with Western Construction Co.'s 20-B Bucyrus on the same project. His address is 1025 North Vermont, Hollywood.

W. R. Lake is pushing the steam through the pipes on the 20-B Bullseye. Lake receives his mail in care of Western Construction Co., 535 Douglas Building, Los Angeles.

Southern States News

BY C. N. BALLENTINE AND W. W. WHORLEY, BIRMINGHAM, ALABAMA

S. Hamilton, an old-time shovel man, dropped in to see us recently. Mr. Hamilton has been operating for the Alco Mining Company, and with the coming of cold weather is anxious to locate somewhere in Florida. Anyone looking for a good shovel man can reach him at Carrollton, Alabama.

John T. Flannagan of Blytheville, Arkansas, who has been doing a large amount of drainage work in that district, was recently awarded contract for the construction of 20 miles of roadway for the Cairo, Truman & Southern Railway, near Truman, Arkansas.

W. J. Newman of Chicago is making rapid progress with his 30-B excavating for the foundation of the new Gayoso Hotel in Memphis.

The Canal Construction Company of Memphis were successful in securing 700,000 yards of drainage work recently near Jonesboro, Arkansas. Cobb & Lee of Jonesboro are the engineers in charge of this work.

Dewey Caillouett is operating a Bucyrus Class-7 dragline for the Bogue Phalia Drainage District, at Trail Lake, Mississippi.

Hegeman & Harris of New York are making rapid progress on the construction of the new Vanderbilt Medical School buildings at Nashville, Tennessee.

List & Gifford of Dallas were recently awarded a large grading contract including sidings for the Universal Gypsum Company at Rotan, Texas.

Vilbig Bros. of Dallas have completed excavation for the first unit of the Southern Pacific warehouse in Dallas.

Hardaway Contracting Company of Columbus, Georgia, was low bidder on a large amount of road work at Escambia Bay in Florida.

Hunter & Gladwell, Lake City, Florida, were awarded 14 miles of road between Madison and Greenville, Florida.

Dr. F. S. Whitney of St. Augustine, Florida, was awarded 8 miles of highway construction in Pasco County.

S. T. Buchanan & Sons of Lakeland, Florida, were awarded a nice road job at Sarasota, Florida.

C. F. Lytle, Jacksonville, Florida, was awarded the Volusia County work at a total cost of $191,432.00.

Langston Construction Company, Titusville, Florida, were awarded a road job in Brevard County, which will amount to 285,562.00.

Morgan-Hill Paving Company of Jacksonville and Birmingham were awarded the Nassau County road project.

Boone & Webster, who are well-known drainage contractors in the Mississippi Delta country, are now at work near Punta Gorda, Florida.

Mr. J. L. Cresap, who has been acting chief engineer of the Florida State Road Department since last August, was recently formally elected chief engineer, which is concrete evidence of his very capable management.

Mr. J. G. Creveling, Commissioner of Highways of the State of Tennessee, in company with Mr. C. N. Bass, First Assistant State Highway Engineer, was a visitor to the Highway Engineers' Convention recently held in New Orleans.

St. Louis Items

BY A. B. KOENIG

We wish all our readers a Happy and Prosperous New Year.

Lord & Talbot, Rooms 413-414 Lahl Building, Monmouth, Illinois, have 43,000 yards of grading, short haul work on state road in Hancock County near Carthage, Illinois, to sublet. This will be a nice job to begin early spring work on. Must be completed by September 1, 1924.

Bids for the construction of 129 miles of hard roads will be received by the State Division of Highways at Springfield, Illinois, December 21.

Hodge & Hampton, Millersburg, Ohio, have two steam shovels idle that they can place on work immediately.

Otto Piffel, Webster Groves, Missouri, has an 11-team grading outfit idle.

T. P. Newland is now with Beamer & Van Horne on state highway at Fulton, Missouri.

Plans are being made to build a road from Cotter, Arkansas, to the site of the Dixie Dam along the bank and bluff of White River, a distance of six miles. The railroad built to the dam from the Cotter yards for hauling material will also be built along the same grade. Work is expected to begin immediately.

Graves & Bradley have moved their team outfit on to a state highway job near St. Peters, Missouri.

Miss Tessie Mulvill, bookkeeper for Mulvill Bros., had a new one pulled on her the other day. While in the Peoples Bank at Shipman, Illinois, a skinner working for Contractor Fortine, one of their subs came in, said to her, "Say are you de party dat mixes up the ink, Miss Mulvill?" "Well what will you have?" The skinner handing her a time check said, "Well here mix me up a hike." The hike was mixed all right, for the last seen of the skinner he was heading south, looking for a hootch dump.

J. L. Drace finished his road contract near Deckerville, Missouri. He has two dry land walking machines idle that he can place on work immediately.

Alfred Peterson, who can be addressed care of Brentwood Pharmacy, Webster Groves, Missouri, will have a 13-team outfit idle in a few days. He wants any kind of grading.

L. S. Kuhn Construction Co. are working on state highway in DeWitt County, Illinois.

J. W. McMurry Contracting Co., Kansas City, got in on several nice pieces of work in the western part of this state.

John Marsch, Inc., have several big steam-shovel outfits on the Illinois Central Railroad near Paducah, Kentucky.

C. W. Marshall has a shovel outfit on the Illinois Central Railroad near Madisonville, Kentucky.

The Illinois Central Railroad has awarded a contract to Joseph E. Nelson & Sons of Chicago for construction of a freight and passenger station at Baton Rouge, Louisiana, at a cost of approximately $500,000.

Wm. Dankieff was awarded contract for grading a 4-mile extension of the Jefferson-Southwestern Railroad from Nason to Waltonville, Illinois, where they will make connections with the Burlington Railroad. Dankieff says he has enough work to keep him busy all winter.

Labor, both white and colored, are more plentiful in St. Louis and Kansas City since December 1st than they have been at any time in several years.

Contractors when in want of work or labor for their outfits write or wire Koenig Labor Agency, 612 Walnut Street, St. Louis, Missouri, or 501 Delaware Street, Kansas City, Missouri.

S. S. Connett of Faucett, Buchanan County, Missouri, was re-appointed vice-chairman of the Missouri State Highway Commission by Governor Hyde for a six-year term ending December 1, 1929.

William M. Spann, Division Engineer connected with the Missouri State Highway Commission, with several assistants, began making a survey of the road from Platte City, Missouri, to Leavenworth. The Platte City road is a part of the Missouri State Primary Highway System and eventually will be hard surfaced.

H. F. (Big) Riley and Louie Demitch, both looking and feeling fine, stopped off a day here on their way back to Chicago from Hot Springs.

Minnesota

Mr. M. O'Donnel of Nashwauk is craning Bucyrus 75-ton shovel No. 431 for the M. A. Hanna Company at this point. This shovel is nearly 22 years old, having been shipped from the Bucyrus plant in 1902.

Mr. O'Donnel writes as follows: "I am craning an old Bucyrus No. 431, and I think it is older than I am myself, but Oh, Boy, she is some good old mill yet!"

Mr. O'Donnel is apparently still a kid.

Canada

Montreal and Vicinity

BY J. M. WARD, MONTREAL

Three new dams will be built shortly in the province of Quebec if the plans of certain companies materialize and the permission of the Provincial Government can be secured. The construction of one of the dams will necessitate the erection of a large hydro-electric plant in the town of Chicoutimi, and will contribute greatly to the development of that region. Price Bros. Co. now have the plans for the largest of the dams under consideration, and it is expected that the work will go forward shortly. It is also understood that the new hydro-electric plant will be started as soon as work on the new dam is finished. A second dam will be constructed on the Asksetisk or Asberish River by W. W. Thomas, Proprietor of the seigniory of Lake Temiscouata. With construction of the dam on the Asksetisk River, the cantons of Raudot and Hocquart, in Temiscouata County will be inundated. The third dam will be constructed on the head waters of Lakes Thomas and St. Vincent, in order that the Donnacona Paper Co. may continue its lumbering operations.

Tenders for Section 8 of the Welland Ship Canal are being received at Ottawa until January 15, 1924. A deposit cheque of $550,000 is required.

We had a visit last month from Mr. S. C. Telfer, Secretary-Treasurer of the Bedford Construction Co. of Halifax, who are at present building a railway in Jamaica.

Mr. Tom Gorman, of Gorman & Peckham, contractors on the Kenogami Dam, was in our office the other day.

We were honored last week with a visit from Mr. T. A. Burns, of the Bucyrus New York office.

L. A. Ott & Co., Montreal, are so well satisfied with their 20-B Bucyrus shovel which they purchased last spring that they have just placed an order for another one.

It is thought that the Dominion Government will once more introduce their Branch Railway Lines Bill early in the year. This was killed last year but demands have been so insistent that the Government proposed to re-introduce it. This will mean considerable construction work, and it is hoped that the Bill will pass.

Toronto and Vicinity

BY N. DE WIND

The Toronto Suburban Railway and the Canadian Pacific Railway have let a contract to Roger Miller & Sons, Toronto, for the grade crossing near Lambton west of Toronto. The work consists of excavation of the subway and approaches, and the placing of concrete retaining walls, etc.

The Lumsden Engineering and Transport Co. have made a good start on the excavating for the tailrace at Dam No. 9 of the Trenton Canal. This work is mostly steam shovel and truck operation, where the bed of the river is being deepened.

Extension of time for tendering has been made on Section 8 of the Welland Ship Canal, which were originally advertised for December 27th. The new date is January 15, 1924.

Bates & Rogers Construction Co. have discontinued work on their contract for concrete cribs at Port Welland on the Welland Ship Canal. They expect to resume as soon as spring weather permits.

The Russell Construction Co. have completed the excavations for footings of the new East St. Clair Bridge at Toronto. As we go to press some 2000 cubic yards of concrete are in place and plans are made to carry this work right through the winter.

The Ontario contingent visiting the Chicago Road Show will be more numerous and representative than ever before. It is expected that our new Minister, the Hon. G. S. Henry, and the new Deputy Minister, Mr. S. L. Squire, will represent the Ontario Government. Chicago's good example should be followed by Toronto, which is the logical center for a representative Canadian exhibit and assembly of talent in highway construction.

Vancouver Notes

BY J. C. MOON

Announcement of one of the most comprehensive and ambitious road-building programs ever undertaken in British Columbia was made by Hon. Dr. W. H. Sutherland, Minister of Public Works, to the members of the Legislature on December 5th, when he outlined a plan of main highways and feeders that would take at least five years to complete, and which would mean the ultimate expenditure of approximately $20,000,000.

Proposed in the scheme is the carrying out of a system of permanent improvements of the trunk roads of the province, and along with this will go a scheme of building lateral settlement roads to act as feeders to the trunk roads. It will include a network of roads throughout the whole province.

Hon. Mr. Sutherland intimated that work on the road-building program would commence early next spring and would be carried to completion as fast as funds are available and settlements of the various areas warranted it.

Winnipeg and Vicinity

BY F. X. AMOSS

An Interprovincial conference on "Good Roads" was held in Winnipeg the first week in December and was very successful in every respect. Besides the discussion of new methods in road building, one of the most important discussions was the allocation of taxes to pay for the construction of new roads.

TRADE NOTES

The Chicago Pneumatic Tool Company, New York, announces the General Machinery Company of Spokane, Washington, as their agents in the eastern part of the State of Washington and northern part of Idaho.

Blaw-Knox Company, Pittsburgh, Pennsylvania, announces that after December 1st Charles K. Wehn will be in charge of a special department devoted to Blaw-Knox standard steel buildings and structural steel in Illinois and adjoining states.

In any construction problems of this nature Mr. Wehn will be available for consultation and personal engineering service. His headquarters will be in Blaw-Knox Company's Chicago Office, Peoples Gas Building.

Dwight P. Robinson & Company, Inc., of New York, have opened an Atlanta Office in the Healey Building, with W. Rawson Collier in charge. Mr. Collier was for many years with the Georgia Railway & Power Company.

The opening of the Atlanta office gives the company a total of eight branches. Other branches are at Chicago, Pittsburgh, Youngstown, Philadelphia, Montreal, Los Angeles and Rio de Janeiro.

The Lakewood Engineering Company of Cleveland, Ohio, announces that as of November 1, 1923, the sale of its construction and paving equipment has been placed in the hands of Brown & Sites Company, 30 Church Street, New York City.

From 1912 to 1918 this company represented the Lakewood Engineering Company, and are, therefore, taking up the line again, having full knowledge of it and being in a position to render the intelligent service which is so essential to the contractor.

REVIEW OF BOOKS and CATALOGS — **We shall be glad to review, in this column, such books and catalogs as are sent to us.**

BUCYRUS 20-B DIESEL SHOVEL AND DRAGLINE EXCAVATOR — Describing a new ¾-yard combination shovel, dragline, clamshell excavator and crane equipped with a Diesel engine. Ask for Bulletin B-201-S, *Bucyrus Company, South Milwaukee, Wisconsin.*

THE BARNES MANUFACTURING COMPANY announce in their new bulletin No. 25 their new 4-cylinder centrifugal pumping outfits, especially adapted to gravel washing, irrigating, drainage work, quarry pumping, draining clay pits in brick plants, etc. Further information may be obtained from *The Barnes Manufacturing Company, Mansfield, Ohio.*

· FIELD NOTES ·

Truck Operation in Cold Weather — II

By P. L. Sniffin

The contractor who wants to use his motor trucks through the winter months must pay attention to several very important rules of maintenance or he will encounter high repair expense. As pointed out in the last installment in the December number of this paper, the radiator requires special care and an anti-freezing solution, preferably a mixture of alcohol and glycerine should be used. Other parts of the truck, both of the motor and chassis should be inspected and adjusted at the beginning of a winter season.

Obtaining Traction in Running

Along with the slippery pavements of winter comes the need for the contractor to instruct his truck drivers as to the methods of getting the traction required to keep the truck moving. Here are some valuable points in this connection:

It is very difficult to prevent spinning without traction devices. Often by throwing a little sand, straw, excelsior or an old sack under the wheels it will assist in getting started. Do not spin the wheels to get traction, as this reduces the grip of the tires on the roadbed. Do not speed the truck in either gear nor apply the power suddenly. This strains the engine and transmission, and burns and wears the rubber in tires. Better results are obtained when on slippery pavements or ice if the truck is started slowly.

The minimum use of skid chains when not needed for traction means the maximum service and wear in the tires. The average driver dislikes to get out in the mud or snow and put his chains on the wheels. This may be due to the difficulty in installing non-skid chains. For this reason chains should be used that can be applied and taken off quickly, and should only be used when necessary to obtain traction. Chains should not be left off until the truck is buried to the hubs, but should be installed for the purpose of carrying it through these places, and it is hardly necessary to use them except when the truck is obliged to use low speeds in pulling. Never use chains on hard roadbeds unless necessary to obtain traction. Chains are so constructed as to grip the ground and are necessary only when they imbed themselves in the roadbed. On hard surfaces where they do not imbed themselves in the roadbed this pressure is taken up by the tires and eventually cuts into the rubber, and in a short time will ruin the tires. It is much better to take the chains off when not in use, thus saving the wear on the tires, and to reduce the vibration of the mechanical parts of the truck. Time in taking them off can be quickly made up in actual running without chains.

The momentum of the truck will often carry it through a short bad stretch. Before starting through such roads the shifting lever should be put in low gear. To step in a mud hole to change gears means only to stay there indefinitely. There is only one surety of pulling through bad stretches of road. Install chains beforehand and avoid getting stuck and laboring under hard conditions to get out. This preparedness saves a great amount of lost time and hard work, and it only requires a few minutes to install proper traction devices, while it may require a matter of hours to get out if they are not put on.

Poor traction in snow banks and drifts is caused by the resistance against the front wheels. It is necessary for the front wheels to form the opening track, and instead of climbing the drifts and cutting the path the wheels push the snow ahead.

Winter Driving Rules

Most trouble from accidents in winter comes from driving fast down hill. A truck is almost unmanageable when brakes are suddenly applied going down a slippery grade. Even though your truck may have non-skid chains, it is necessary to look out for the other fellow as well.

The driver who brings his truck to a sudden stop, and then leaves it standing for some time, will invariably find that it is hard to get traction in starting. This is because ice has formed under the wheels, and it can be avoided by releasing the brakes just before coming to a stop and allowing the truck to coast the last few inches.

In a snowy period, and when pavements are slippery, always carry a shovel, pick, box of sand and chains.

To secure a clear view ahead through the glass of the windshield in rainy weather is vitally important to the safety of the motor truck and its occupants. Many schemes are used to keep the glass clear in wet weather, but perhaps the old-fashioned alcohol and glycerine mixture which is carried in a small bottle and rubbed on glass as needed, is best. If the bottle containing the solution is wrapped in a cloth and stowed in the side pocket, it will always be ready for use and a cloth to apply it with will be at hand.

There is one particular precaution that the contractor should take in operating a truck over slippery pavements and that is to avoid overloading, or, if this is impossible, to see that the trucks are driven accordingly. When this is done, it not only adds to the rolling motion of the truck downhill but it reduces the effectiveness of the brakes in stopping the truck at any time. Therefore, the driver should take into consideration the effect of an overload and exercise commensurate judgment in this respect.

Trade **TISCO** Mark

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The Excavating Engineer

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CONTENTS

Front Cover Illustration
Bucyrus 225-B in the Plymouth Mine on the Gogebic Range near Wakefield, Michigan. At the time this photograph was taken, the machine was owned by Coates & Tweed, Duluth, Minnesota, who later sold the property and equipment to Pickands-Mather Company of Cleveland, Ohio, which company is now operating the pit and still using this shovel.

Articles
The Detroit Sewage Program — II 55
The Conners Highway Through the Florida Everglades 59
Locating Motor Truck Noises (By P. L. Sniffin) 61
Digging the Dixie Highway in Kentucky 62
Photographs from the Field 64-65

Editorials
The Small Revolving Shovel and Highway Work 66
Diesel Shovel Costs — A Correction 66
Railroad Construction will Show Increase in 1924 66

Field Notes
Convenient Drill Sharpening 67
Method of Handling Pontoons Under Traction Wheel Shovel Eliminates Pit Crew 67

Devices You Ought to Know About
New Track Shifter 68
The Avery "Road-Razer"-Maintainer-Snow Plow 68

Shots from the Firing Line 69-73
Trade Notes 73-74
Review of Books & Catalogues 73

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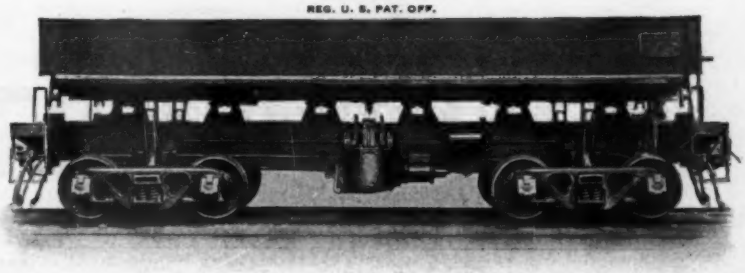

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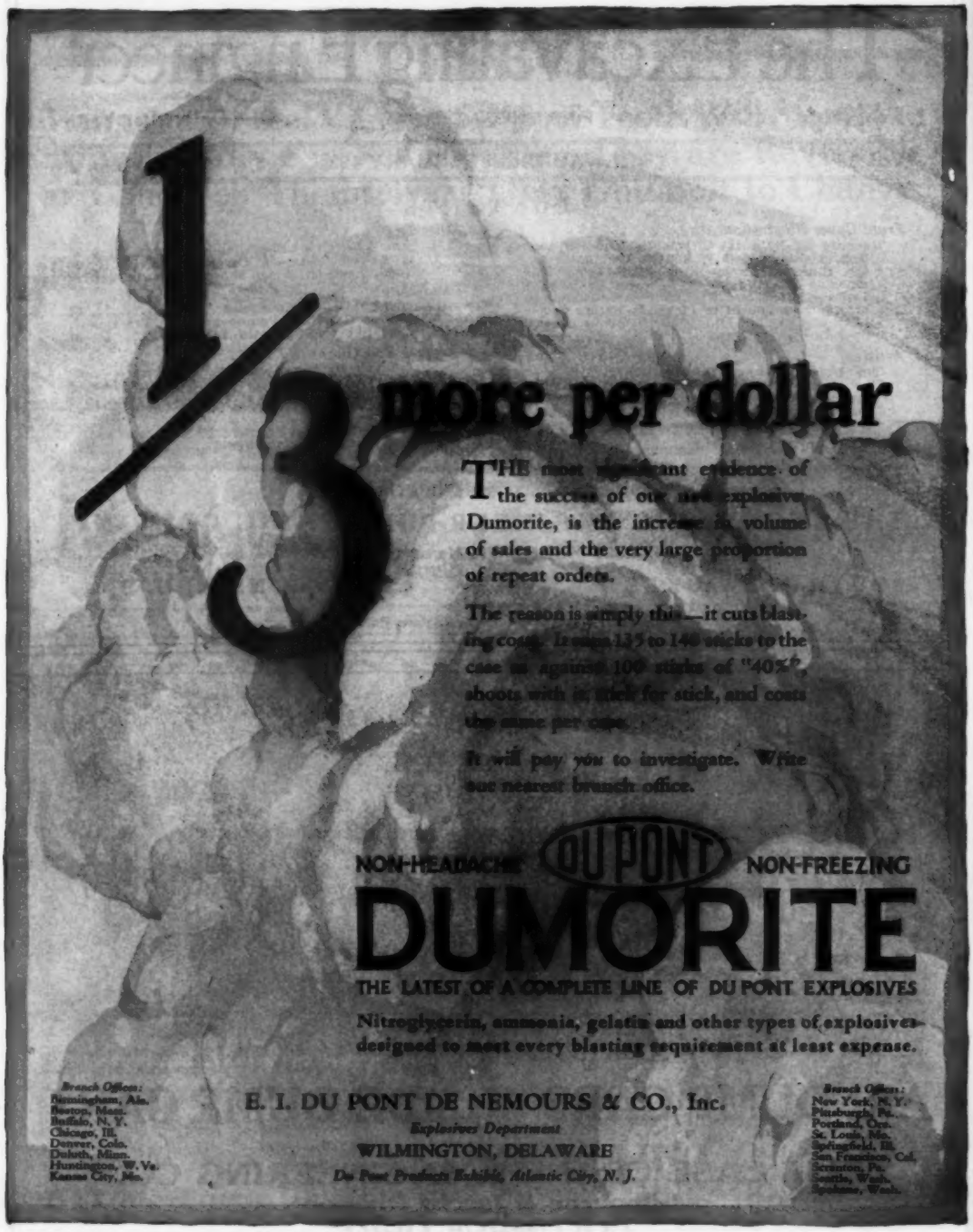
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